

**SOUTHEAST/ENCANTO COMMUNITY PLAN UPDATE
POTABLE WATER TECHNICAL REPORT**

December 3, 2012

**Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
(760) 438-4422**

Job No. 596-001

TABLE OF CONTENTS

PAGE NO.

POTABLE WATER SERVICE PRESSURES %

POTABLE WATER DISTRIBUTION SYSTEM.....)

POTABLE WATER SYSTEM REDUNDANCY AND RELIABILITY%\$

FIRE FLOW BASED ON ZONING%%

POTABLE WATER SUPPLY.....%&

LIST OF FIGURES

		<u>PAGE NO.</u>
FIGURE 1	WATER PRESSURE ZONES.....(
FIGURE 2.1	EXISTING POTABLE WATER DISTRIBUTION SYSTEM, SOUTHEASTERN SAN DIEGO	
FIGURE 2.2	EXISTING POTABLE WATER DISTRIBUTION SYSTEM, ENCANTO	-

Southeast/Encanto Community Plan Update
Potable Water Technical Report

POTABLE WATER SYSTEM SERVICE PRESSURES

A general measure of the adequacy of a potable water system is the range of water service pressures within the service area. An ideal range of water service pressure is between 65 psi and 120 psi. Pressures lower than 55 psi may result in consumer complaints. Higher pressures are not too great of a concern for consumers because of the Plumbing Code requirement to have pressure regulators on all services greater than 80 psi. High system pressure is more of a concern to the City Water Operations as pipeline leaks or pipeline breaks will be more severe if the system is operating at higher pressures. The following paragraphs will provide an overview of the water service systems for the Southeast San Diego and Encanto community planning areas as one means of characterizing the adequacy of the existing water service system.

Southeast San Diego Planning Area Service Pressures

The Southeast San Diego Community Planning Area is served entirely by City water. The whole planning area is served by the University Heights 390 Pressure Zone. Service by a single pressure zone is achievable because of the small range in topography within the planning area. At the south and western boundaries of the planning area, surface elevations range from 20 feet to 85 feet above mean sea level. Along the Highway 94 corridor, from west to east, the elevations increase from 85 feet to 175 feet above mean sea level. On the eastern edge of the planning area which follows generally the Interstate 805 Freeway, the elevations are at a high of 175 feet at Highway 94 and reduce to around 100 feet at the southeastern corner of the planning area.

Thus, the overall range of elevations is from 20 feet to 175 feet above mean sea level. Based on these elevations the maximum static water system pressure within the planning area ranges from a low of 90 psi to a high of 160 psi. While pressures above 150 psi are not desirable as this is the maximum working pressure of most standard water pipe, only the southern-most portion of the Southeast San Diego community planning area experiences these higher working pressures.

Generally, the water service system for the Southeast San Diego planning area can be rated

Southeast/Encanto Community Plan Update
Potable Water Technical Report

well because of the available working pressures in the water system. With the working pressures greater than 90 psi there is adequate pressure for daily domestic use. More importantly, these working pressures result in greater fire hydrant flow capacities which provide for public safety.

Encanto Community Planning Area Service Pressures

The Encanto Community Planning Area is also served by City water. This planning area is serviced by three different pressure zones. This is due to the variation in topography within the planning area.

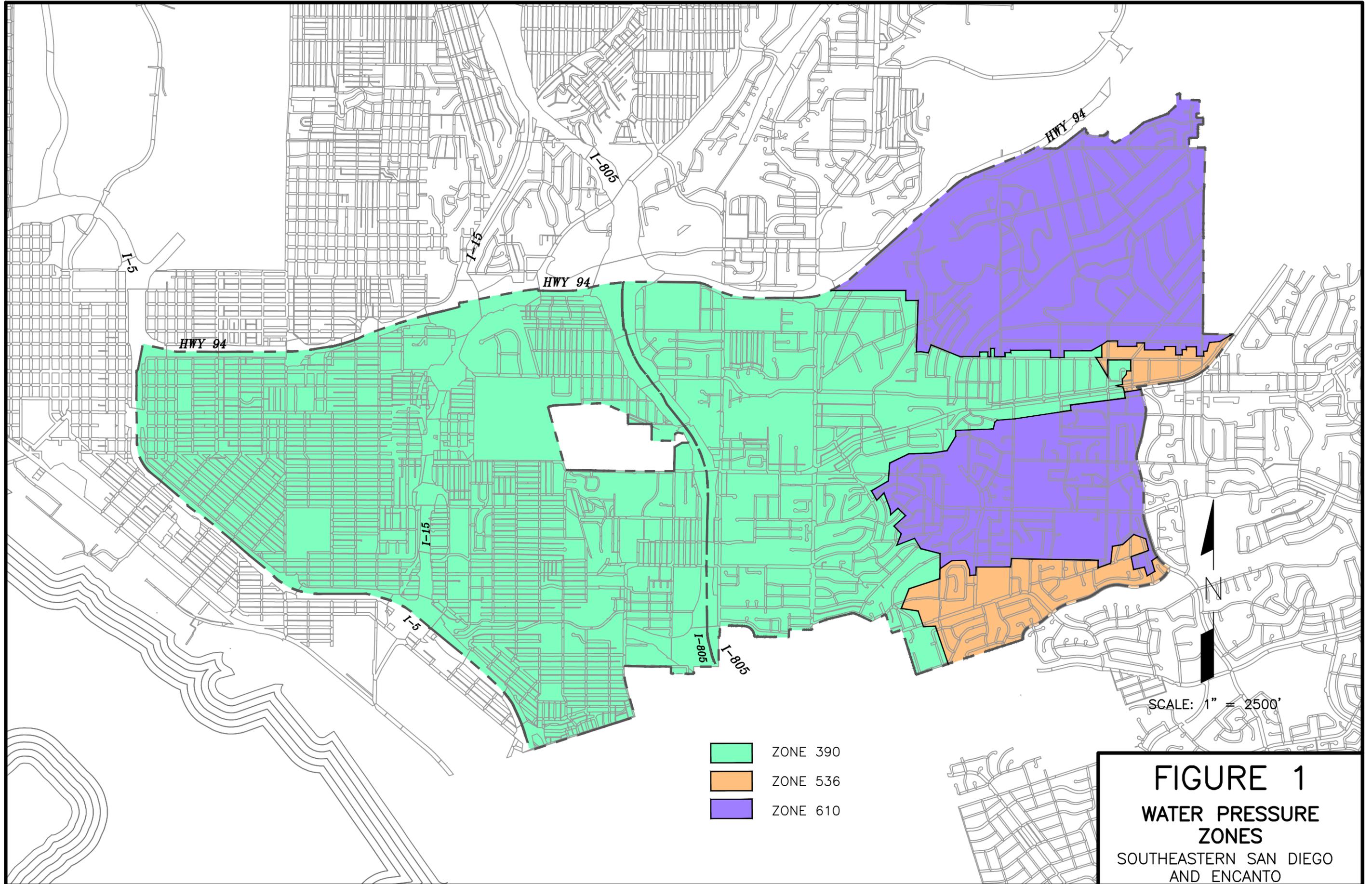
The western half of the planning area is served by the University Heights 390 Pressure Zone. A second service zone is the Alvarado 536 Pressure Zone; only about 15% of the planning area is served by this zone. There is a pocket of Alvarado 536 Zone service in the central east end of the planning area, and a larger portion along the southeastern boundary of the planning area. The third pressure zone providing service is the Paradise Mesa 610 Zone. This zone provides service to the northeast quadrant and the southeast quadrant.

Elevations in the Encanto planning area which are served by the University Heights 390 Zone range from 85 feet to 240 feet above mean sea level. This results in a maximum static pressure range of 65 psi to 130 psi which is nearly ideal. The area served by the Alvarado 536 Zone ranges in elevation from 204 feet to 275 feet above mean sea level. The maximum static pressures range between 113 psi and 144 psi. For the Paradise Mesa 610 Zone, service elevations range from 230 feet to 450 feet above mean sea level. Here the maximum static service pressures vary from 69 psi to 165 psi.

The water service system for the Encanto planning area can be rated well because of the available working pressures in the water system. The lowest static pressure is at the minimum desirable pressure of 65 psi. The maximum pressure of 165 psi exceeds the desirable pressure of 120 psi, but is not significantly greater than the maximum of 160 psi for the Southeast San Diego planning area. The areas with the higher static pressures are always minimized but often cannot be avoided and still provide water system redundancy and reliability.

Southeast/Encanto Community Plan Update
Potable Water Technical Report

With the static pressures greater than 65 psi there is adequate pressure for daily domestic use.



Southeast/Encanto Community Plan Update
Potable Water Technical Report

POTABLE WATER DISTRIBUTION SYSTEM

Potable water distribution is critical to meeting the domestic and fire protection service needs in a reliable manner. The City of San Diego's water system includes water storage reservoirs in the mountains to the east of the City, water treatment plants which treat the raw water, and transmission piping systems which convey the treated water to local water storage tanks and distribution systems. The City also obtains much of its water from the San Diego County Water Authority. The SDCWA deliveries are both raw water as well as treated water. This system of supply sources, transmission pipelines, and distribution piping work together to maintain water delivery to the City's customers.

For the Southeastern San Diego and Encanto planning areas, the primary water source is the Alvarado Water Treatment Plant which is located adjacent to Lake Murray. Treated water from this plant is conveyed by large diameter pipelines to the use areas and then smaller diameter piping distributes the water to all the customers.

Southeast San Diego Planning Area Water Distribution

The Southeast San Diego planning area is bounded by the bay along the west and abuts National City on the south. Thus, it can be characterized as being at the end of the water system pipeline. Even so, there are several large diameter transmission mains which are located within this planning area and provide water transmission capacity. There are three 30" diameter pipelines including the 28th Street Pipeline, the Bonita Pipeline, and the Commercial Street Pipeline. These three pipelines create a large looping system through the north half of the Southeastern San Diego planning area. A 24" and 16" pipeline in S. 30th Street and a 16" diameter pipeline in S. 36th Street provide means to convey water to the southern portions of the planning area. All these pipes are carrying water to serve the University Heights 390 Zone.

The remaining piping within the Southeastern San Diego planning area is 12" and smaller and provides local water distribution. This planning area encompasses an older portion of the City of San Diego; therefore, most lots have already been built upon. The lots are generally small and the water distribution system is well interconnected. Most piping is 8" diameter which is typical for residential land uses. There are also some 6" diameter pipes;

Southeast/Encanto Community Plan Update
Potable Water Technical Report

while the current City guidelines do not permit the installation of pipe smaller than 8" diameter, the existing 6" diameter piping is not widespread enough to result in a constriction in the distribution system which might affect the capability of the water system to deliver adequate flow and pressure.

Encanto Planning Area Water Distribution

Water distribution for the Encanto planning area is more complicated than for the Southeastern San Diego planning area but only because there are three water service pressure zones. Since this planning area is closer to the main source of supply of water to this area, the Alvarado Water Filtration Plant, the transmission main sizes running through the Encanto planning area are larger.

The largest of the transmission mains is the 36", 42", and 48" Otay Second Pipeline. This is a north-south pipeline which can function to transfer water from the Alvarado Water Filtration Plant service area to the Lower Otay Water Filtration Plant service area in South San Diego. This pipeline is located in 60th Street, Brooklyn Avenue, and short stretches of Otay Street and South Woodman Street. The rest of the pipeline is located in an easement outside of public roads. This pipeline most often carries water from the Lower Otay Filtration Plant system to the Alvarado Filtration Plant service area; it is designated as an Alvarado 536 Zone pipeline.

The next largest pipeline is the 36" Otay Mesa Bonita Connection Pipeline; it is located in Imperial Avenue between Otay Street and Euclid Avenue. As its name suggests, it creates an intertie between the Otay Second Pipeline and the Bonita Pipeline which extends into the Encanto planning area from the Southeastern San Diego planning area. The Otay Mesa Bonita Pipeline carries University Heights 390 Zone water.

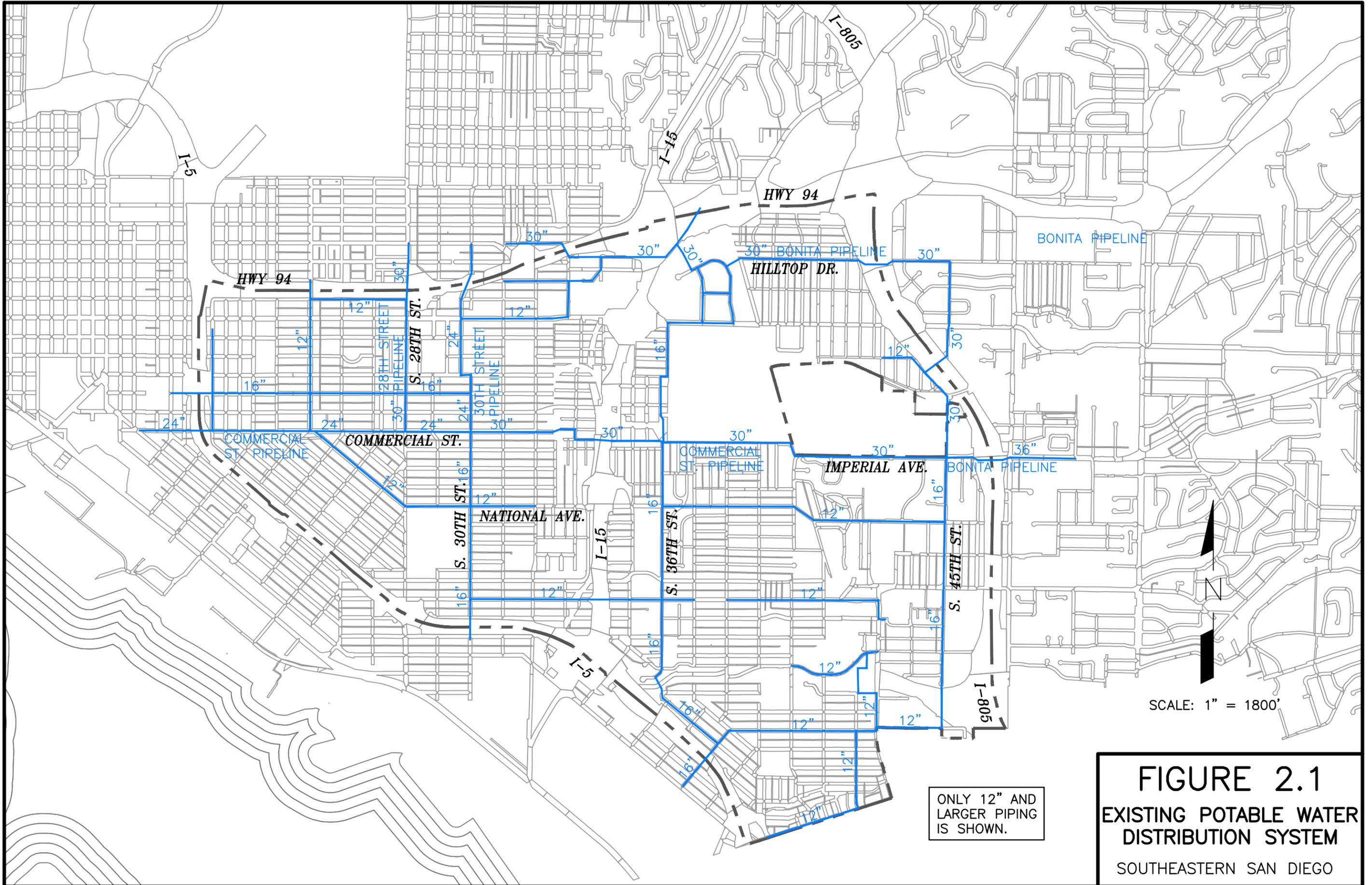
The Bonita Pipeline also carries University Heights 390 Zone water and it extends through the University Heights 390 Zone service area which encompasses the western portion of the Encanto planning area. In Imperial Avenue it is a 36" pipeline and in Euclid Avenue it extends south to the southern planning area border as a 24" water main.

The Paradise Mesa 610 Zone in the Encanto planning area is supplied by the 65th and

Southeast/Encanto Community Plan Update
Potable Water Technical Report

Herrick Street Water Booster Station. This station takes Alvarado 536 Zone water from the Otay Second Pipeline and boosts it to the 610 pressure zone. In 65th Street north of Herrick Street is a 24" pipeline which reduces to a 16" pipeline in Klauber Avenue and is called the Encanto Park Pipeline.

As in the Southeastern San Diego planning area, the distribution piping in the Encanto planning area is composed of 6" through 12" pipelines which are well interconnected. Most of the existing piping is asbestos cement pipe and polyvinyl chloride pipe.



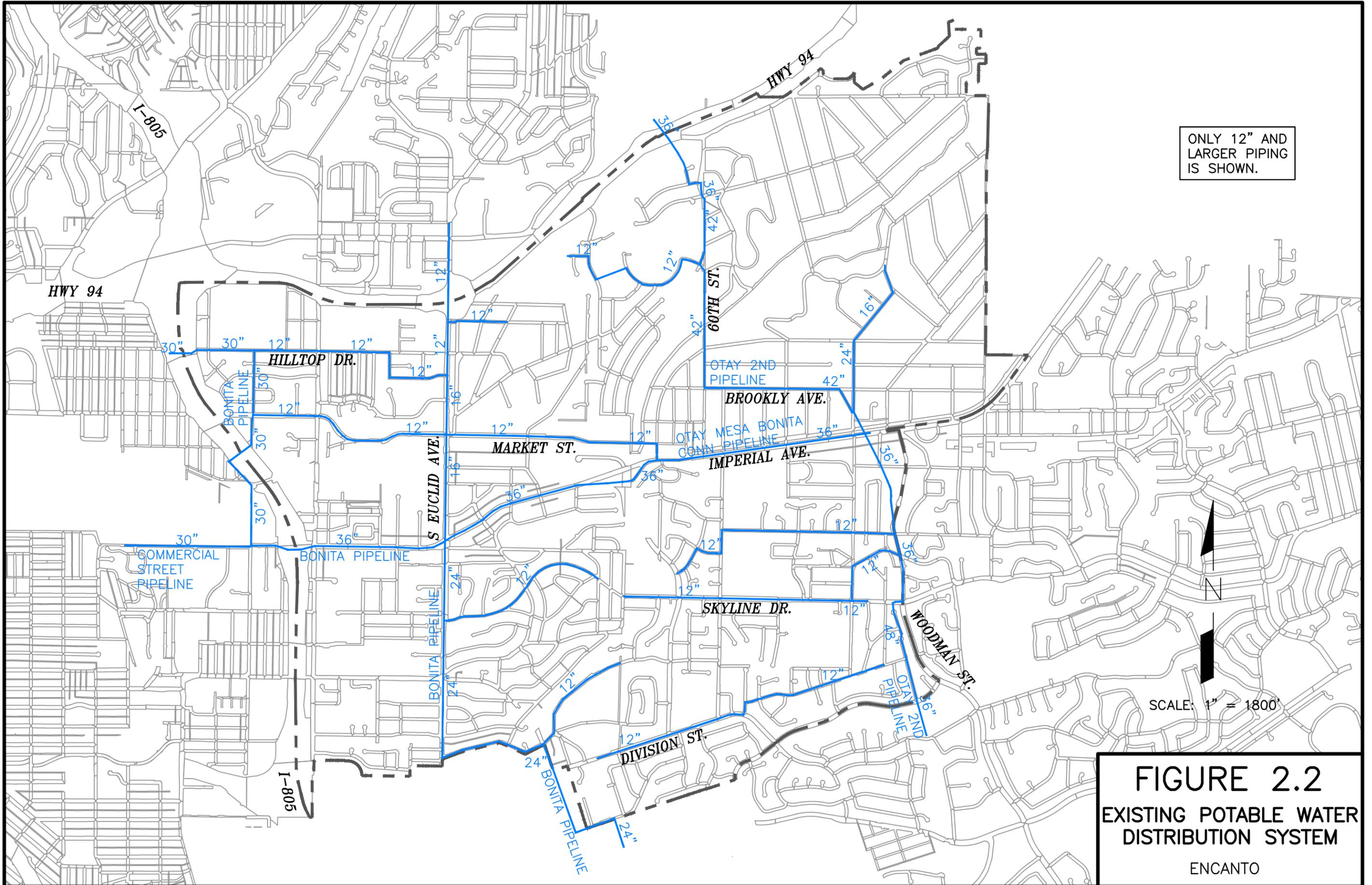


FIGURE 2.2
EXISTING POTABLE WATER
DISTRIBUTION SYSTEM
ENCANTO

POTABLE WATER SYSTEM REDUNDANCY AND RELIABILITY

Water system redundancy and reliability is critical to providing satisfactory domestic and fire protection service. Redundancy has to do with the water system's capability to deliver water at all times under reasonable expected conditions. The definition of water system redundancy is having the ability to maintain water delivery to customers when one critical pipeline segment is out of service due to maintenance activities or an unforeseen condition such as a pipeline break. This feature of any water distribution system can be considered as a local characteristic.

Water system reliability can be considered as having more to do with the source of supply of the water that is being delivered to customers. The definition of reliability is maintaining sufficient sources of supply to a service area so that if one source is unavailable the other existing sources can compensate for the lack of supply from the first source. This feature of a water system is applicable to a greater area than water system redundancy; it may encompass one or more communities but not stretch beyond the boundaries of the City.

For both the Southeastern San Diego and Encanto planning areas water system redundancy is adequate. This is so because of the interconnectedness of the water distribution system which is a result of the high percentage of developed parcels within these planning areas. Since these two planning areas are in older parts of San Diego, most land parcels have been built on and streets and alleys have been constructed within which is located the water distribution system piping. Water system redundancy ensures that public health and safety are protected in that water quality and quantity are maintained to the public and water for fire fighting capability is always assured.

Water system reliability for the Southeastern San Diego and Encanto planning areas is sound. This is due primarily to the several large diameter water transmission pipelines which traverse these planning areas. These multiple pipelines provide water system reliability because they are connected to two independent water supply sources. The primary supply source is the City's Alvarado Water Filtration Plant at Lake Murray. The second supply source is the Lower Otay Filtration Plant at the Lower Otay Reservoir.

Southeast/Encanto Community Plan Update
Potable Water Technical Report

The 28th Street Pipeline, the 30th Street Pipeline, the Otay Second Pipeline, and the Bonita Pipeline carry water from the north into the Southeastern San Diego and Encanto planning areas. These pipelines are connected to the Alvarado Water Filtration Plant supply which flows from the north and east of the subject planning areas. Within the Encanto planning area, the Otay Second Pipeline and the Bonita Pipeline extend south and provide a second potential supply from the Lower Otay Filtration Plant. Because these two pipelines are connected by the Commercial Street Pipeline which extends west of the Encanto planning area, this enables the Southeastern San Diego planning area to benefit from the Otay Filtration Plant supply if necessary.

FIRE FLOW BASED ON ZONING

The City of San Diego Public Utilities Department water system guidelines address fire flow capability for the water distribution system. For water system planning purposes, expected fire flow requirements are based on land use. A brief summary of the fire flow demands for planning purposes is as follows.

- Single family residential 2,000 gpm
- Duplexes 2,500 gpm
- Multi-family (condos, apts) 3,000 gpm
- Commercial 4,000 gpm
- Industrial 6,000 gpm

For the Southeastern San Diego and Encanto community planning areas, the applicable fire flow demands are those for single family residential, multi-family residential, and commercial land uses. Fire flow demands are analyzed at critical locations to ensure that the required flow can be delivered by the water distribution system while maintaining a minimum residual pressure of 20 psi in the piping system.

To confirm the adequacy of the water distribution system for the Southeastern San Diego and Encanto community planning areas, the City of San Diego Engineering and Program Management Water Modeling Department is preparing several computer model runs for fire flows at critical areas. The results of this modeling will be presented in subsequent drafts of this water technical report.

POTABLE WATER SUPPLY

Water supply for the Southeastern San Diego and Encanto community planning areas is addressed as part of the City of San Diego's comprehensive city-wide approach to water supply planning. Water supply planning is an on-going effort by the City of San Diego Long-Range Planning and Water Resources Division. This division of the City's Public Utilities Department has the responsibility to forecast expected water demand throughout the City and ensure that adequate sources of water are available to meet the estimated future changes in water demand.

Water demand projections are affected primarily by two factors: land use changes and population growth. Land use changes may increase water demand when higher density development is proposed where a lower density land use existed, or water demand may decrease if land use intensity is lowered.

The second factor in projecting future water demand is population growth. This component of the water demand projections is addressed by using future population projections developed by SANDAG. The use of the SANDAG projections provides a measure of uniformity and stability in the growth estimates because the database used by SANDAG is much greater than the City of San Diego. In addition, all the local agencies subscribe to and rely on the SANDAG data for their future growth forecasting in many different fields of interest and for numerous purposes.

To address the State of California requirement as well as to fulfill the local need to project future water supply needs, the City of San Diego, as well as all other water purveyors, prepares an urban water management plan once every five years. This document addresses historical and projected water use within the City's service area, it discusses efforts for developing local water sources and for continuing water conservation practices among its customers, it summarizes water supply sources, and ensures that sufficient water supply will be available to meet projected demands for a 20-year study period.

The most recent City of San Diego Urban Water Management Plan is dated 2010. This document concludes that sufficient water supply is available to meet the projected water

Southeast/Encanto Community Plan Update
Potable Water Technical Report

demands for the City through the year 2035 based on current land use guidelines. Changes in land use planning for the two community plans may alter the total water demand projections for these two areas. Once the proposed land use plan changes are identified, this report will provide an analysis of the impacts to water supply projections and assess the significance of the water supply impact. Depending on the types of land use changes that will be proposed, the total water demands for the Southeastern San Diego and Encanto planning areas may remain approximately the same. In this event, the water supply impacts are expected to be minor.